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**HOME AWAY FROM HOME:
EDUCATION, HEALTH, AND NURSING HOME CARE**

A Thesis in

Sociology & Demography

by

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ABSTRACT

Nursing homes are dominant late-life health care institutions slated to grow in importance as the United States experiences a dramatic demographic shift characterized by a significant segment of the population entering older age groups. Though a substantial portion of the U.S. population is about to enter the period of life in which they are at highest risk of entering a nursing home, we know little about how their demographic identities and accumulated resources influence their decisions about using nursing homes. This study contributes a more thorough examination of the relationship between education, health, and use of nursing homes. Education is hypothesized to affect nursing home usage through two pathways: access (e.g., institutional familiarity) and need (e.g., development of health conditions). Two different models are run using data from Wave 13 of the Health and Retirement Study to explore these questions. The results show that the link between education and nursing home usage primarily operates through the access pathway, as high school and college-educated respondents had significantly higher odds of reporting any nursing home usage compared to their non-degree-holding peers but did not show a significant difference in the expected time spent in nursing homes. These findings have important implications for the influence of education over the life course into older ages and highlight a potential source of health inequity.

TABLE OF CONTENTS

LIST OF FIGURES	v
LIST OF TABLES	vi
ACKNOWLEDGEMENTS	vii
Introduction.....	1
Background.....	4
Theoretical Framework.....	6
Education as an influence on institutional navigation: The nursing home ACCESS pathway	7
Education as an influence on health: The nursing home NEED pathway.....	9
Data, Methods, and Measures	10
Data	10
Dependent Variables	11
Independent Variables.....	12
Analysis	13
Results	14
Model 1: At least one nursing home stay.....	14
Model 2: Number of nights spent in a nursing home.....	15
Discussion.....	17
Mechanism 1: Education increases longevity which increases health needs	18
Mechanism 2: Education decreases health needs, particularly those associated with age	18
Mechanism 3: Individuals’ education may affect how they meet their health needs.....	19
Concluding Remarks.....	20
Appendix	22
References.....	26

LIST OF FIGURES

Figure 1: Two pathways by which education influences nursing home use.....7

LIST OF TABLES

Table 1: Descriptive statistics of analytic sample.....	22
Table 2: Descriptive statistics of group reporting at least one nursing home stay since previous interview.....	23
Table 3: Results of logistic regression model: Any nursing home stay since previous interview.....	24
Table 4: Results of zero-inflated negative binomial model: Number of nights spent in nursing home since previous interview.....	25

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Introduction

The United States is experiencing the onset of a “gray tsunami,” a demographic shift characterized by a significant segment of the population entering their elder years, as the Baby Boomer generation hits retirement age and beyond (America Counts Staff, 2019). The life stage of “old age” is generally understood to begin approximately between 60 and 70 years old, in both the imagination of the American public (Taylor et al., 2009, p. 11) and in research on aging more broadly (Settersten & Godlewski, 2016, p. 13). This is largely due to its proximity to the age of 65 years old, which in the U.S. context indexes a significant change in one’s relationship to institutions, as it has traditionally marked the age of retirement from participating in the labor force as well as the age at which one can begin to receive entitlement benefits such as Social Security and Medicare. While middle age, or the life stage conceived of as the height of economic and social productivity, is “viewed as a time of opportunity and activity,” old age is defined in the public imagination by “decrepitude, dependence, and death” (Angel & Settersten Jr., 2013, p. 96).

In the United States, institutions – such as entitlement programs, insurance corporations, and healthcare service providers – play an outsized role in the construction of age stratification and age expectations across the life course, by using regulative norms and bureaucratic service bracketing to standardize life events and define conceptions of age and life course stages (Mayer & Schoepflin, 1989, p. 197-200). The “old age” stage of life is characterized by a greater dependency on age-dependent institutional support programs (namely, Medicare and Social Security) and institutional social arrangements (such as nursing homes and other long-term care facilities) for the care needed to maintain quality of day-to-day life and well-being due to the

declines in physical, cognitive, and functional health and ostensible increase in dependence associated with growing older (Moen, 2013, p. 185; Diehr et al., 2013).

Nursing homes are an important late-life healthcare institution that provide intensive, medicalized, residential caretaking for the aging and disabled populations. Skilled nursing facilities are predominantly populated by older individuals with some degree of functional disability. In 2015-2016, 83.5% of nursing home residents were aged 65 years or older (Howley, 2020), and more than 85% of residents needed assistance with at least one activity of daily living, including bathing, dressing, toileting, and transferring in and out of bed (Harris-Kojetin et al., 2019). Importantly, residence rates at any given time are not reflective of the true number of individuals who will interact with or become residents of nursing homes at some point in their life, a point made by Shugarman and Brown with, “Although a relatively small proportion of the population is in a nursing home at any given time, the proportion that will enter a nursing home at some point of their lives is high: an estimated 46 percent of individuals 65 and older” (2006, p. 2).

The degree of access to nursing homes (where ‘access’ as it used here refers to the capability of individuals to navigate and secure services for themselves) and the quality of care received by residents within them varies widely between facilities and across states, primarily dependent on the resources and assets residents have prior to entry. One common denominator, however, is the relative inaccessibility of nursing homes’ public-facing resources. In a systematic review of the content of nursing homes’ websites, Shugarman and Brown found that the reading level of the majority of the sites required college-level comprehension skills, which is “far higher than the average reading level of the public,” making these sites “potentially impossible for most to access and understand” (2006, p. 30). In essence, in order to be able to benefit from nursing home residence and care services, an individual must be capable of understanding the nursing home-provided resources and entry process, capable of navigating the complex system to ensure

their eligibility for Medicaid or other benefits, and, if not eligible for subsidies, capable of paying for care out of pocket.

Consequently, the navigation and use of late-life institutions such as nursing homes is facilitated by greater education, which allows individual to more easily navigate, explore, and weigh all of the options available to them as well as advocate for themselves and their interests. For example, college-educated adults may feel more comfortable making informed decisions about nursing home care as a post-hospital discharge option, understanding the requirements of the intake process, accessing all the benefits available to them, and advocating for higher-quality treatment. However, education is also strongly tied to greater health and longevity (Hahn & Truman, 2015; Link & Phelan, 1995; Lleras-Muney, 2005); as highly educated older individuals are more likely to be healthier than their less educated peers, they may also be less likely to need to use a nursing home. The complex and understudied relationship between residents' educational attainment and nursing home usage will be developed and examined here.

A substantial portion of the U.S. population is about to enter the period of life in which they are at highest risk of entering a nursing home, but outside of medical characteristics and Medicare/Medicaid eligibility, we know little about how their demographic identities and accumulated resources influence their decisions about using nursing homes. Who chooses to go into nursing homes, how they make that choice, and the factors involved in the selection of care setting are all areas meriting greater examination. However, the existing literature suggests the importance of family ties, medical conditions, and other sociodemographic characteristics of the individual. This study contributes a more thorough examination of the relationship between education, health, and use of nursing homes as an important late-life health care institution. Insights about the accessibility of nursing homes and their implications for future demographic trends in eldercare settings will be invaluable in preparing the health infrastructure of the U.S. for the rapidly aging population and in mitigating social disparities in accessing care in later life.

Background

The downstream effects of nursing homes on residents and their families have been well documented. However, the upstream influences that determine the degree of involvement in nursing homes in the first place have gone underexplored. Even facing an increase in the population most likely to be served by nursing homes, the literature discerning who exactly is likely to *become* a nursing home resident based on their sociodemographic characteristics is lacking. Schulz and Eden confirm this with their comment that, “A considerable research literature has focused on shared decision making in health care. Research on individual or family decisions regarding nursing home placement or other LTSS issues is scarce” (2016, p. 218). Shugarman and Brown corroborate this with, “More than a million elders enter a nursing facility each year, yet we know little about how consumers of skilled and long-term nursing care select the facility to which they or their loved ones will be admitted” (2006, p. ii). Residents’ educational attainment becomes a factor of particular interest here because of its relationship to nursing homes’ accessibility and because of education’s enduring relationship with health and longevity.

The existing research highlights the importance of individuals’ medical conditions and health history, the presence of a partner, community context, and hints at the importance of sociodemographic characteristics as factors generally involved in care and planning in the near-end-of-life stage. The two most common medical conditions that contributed to nursing home admissions were dementia and stroke because of their long-term cognitive and physical repercussions; other diseases contributed to institutionalization only when they caused functional disability (Van Rensbergen & Nawrot, 2010, p. 46). Thomeer et al. (2015) found that adults without partners have the highest risks of long-term care admission. This is likely because spouses and partners can take on the care-giving role in-home when an individual needs

assistance, either because of a specific disabling condition like dementia or because of more general decline in autonomous functioning.

Another study in the domain of late-life planning identified the importance of the individual's educational and economic background in their decision-making. In a study using the presence of a living will as the outcome variable, Orlovic et al. (2021) found that across many patient characteristics and circumstances, the individual's socioeconomic background and racial/ethnic identity had the largest effects on the outcome. Using the HRS dataset, Orlovic et al. (2021) found that non-Hispanic white individuals, as well as individuals with higher status (measured by degree of educational attainment and income) were more likely to have a living will. While presence of a living will and nursing home usage are clearly different outcomes, both are indicative of an individual's use of resources and ability to make informed choices about how they will live their later years.

Both intimate social ties and community context are important factors in nursing home admission. Muramatsu et al. (2007) found that greater state-level investment in home- and community-based care services decreased the likelihood of nursing home admission for childless seniors but did not affect seniors with children. This suggests that the presence of intra-community and intra-family alternatives for care settings (e.g., home-based care from a licensed provider or home-based care from a close family member) can affect the selection of nursing homes to be the chosen care site.

In terms of prevalence of nursing homes across communities, all states are required to have at least one nursing home that is Medicaid-certified, meaning that individuals who are eligible for Medicaid (usually due to having income and assets below a certain threshold) can be residents without paying for their room, care, and services aiding with routine hygiene care, food and meal assistance, and general nursing needs. However, anything beyond these very basic requirements (e.g., a private room, special dietary provisions, personal clothing, cosmetic and

comfort items) can be charged to the individual (Centers for Medicare and Medicaid Services, 2022). Medicare subsidies operate on a staggered timeline, paying for the full amount for eligible beneficiaries for the first 20 days and 80% for the subsequent 80 days; after the first 100 days, Medicare no longer pays for nursing home costs. In 2021, the nationwide average daily cost for a shared room with no extra amenities or services was \$255, adding up to upwards of a \$7,000 minimum monthly cost (American Council on Aging, 2022). Essentially, nursing homes are relatively financially accessible to the older population based on the provisions of Medicare and Medicaid, however, the quality of care and residence within facilities is heavily economically stratified based on residents' existing financial resources.

In summation, the existing literature identifies and posits a number of sociodemographic and health characteristics – social ties, couple status, history of dementia and stroke, income, and education – as important factors that may influence later-life care decisions. Education, as discussed below, sits at the nexus of these factors, and merits its own examination in relation to institutional care usage.

Theoretical Framework

The use of nursing homes as a healthcare institution can be envisioned as the outcome of the interaction between *access* (one's ability to navigate the process to secure nursing homes an available care option) and *need* (the development of health conditions that require specialized care). Education plays an important role in the determination of both through mechanisms elaborated below and illustrated in figure 1.

Education as an influence on institutional navigation: The nursing home ACCESS pathway

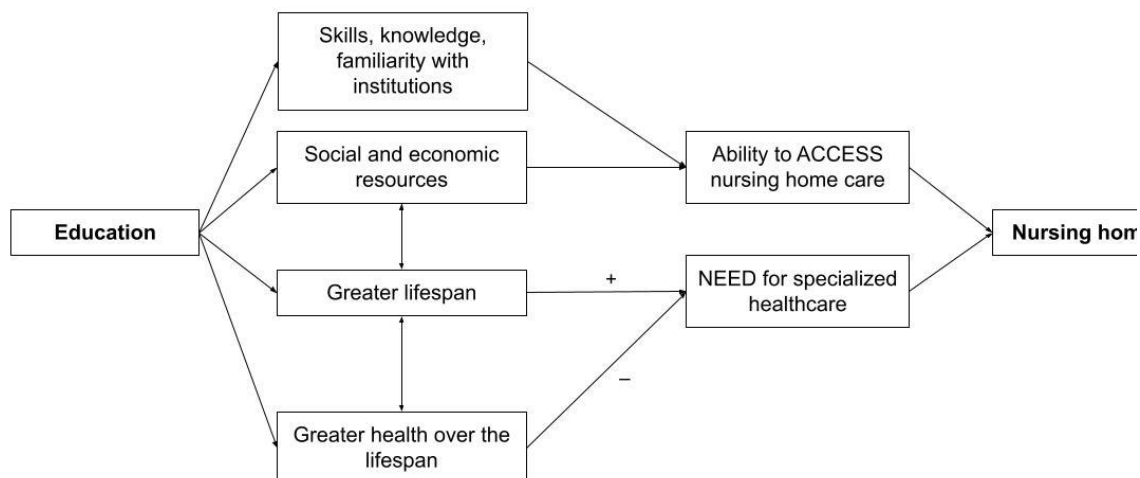


Figure 1: Two pathways by which education influences nursing home use.

Education is conceptualized as a process by which an individual increases their embodied skills, abilities, and knowledge base. Education has both intrinsic and relational value, in that it is itself a source of value and resource as well as serving as a conduit to increase and facilitate the acquisition of other forms of capital and resources.

There have been many attempts to concretize and discretize the value that education – particularly formal education in schools and in universities – intrinsically provides to an individual. Bourdieu (1986, p. 243) terms these resources *cultural capital*, which can be “institutionalized in the form of educational qualifications” and is “convertible, in certain conditions, into economic capital.” Others have used the concept of *human capital*, a resource built through education that allows one to achieve more effective agency, or greater control over their life and choices (Schultz, 1962; Becker, 1964; Mirowsky & Ross, 1998; Mirowsky & Ross, 2005, p. 33). While the conceptualization of the exact value or good provided by formal education is beyond the scope of this paper, the skills and knowledge provided by greater educational attainment would undoubtedly serve a potential nursing home consumer well. The

knowledge base and familiarity with navigating institutions developed through years of schooling (which, when successful, culminates in a degree) allows individuals to more easily interpret the relatively inaccessible public-facing language used by nursing homes (Shugarman & Brown, 2006) and to feel more at ease operating within an institutional setting. Additionally, individuals with a college degree may have a slightly more positive view of institutions in general, given that they voluntarily devoted a substantial number of years to participate in higher education. Overall, education itself may serve to make nursing homes more accessible and facilitate individuals finding high-quality care sites.

Beyond the intrinsic value it affords, education can be a conduit towards acquisition of other resources – particularly social and economic resources. Education has been consistently identified as having deeply interconnected, positive, reciprocal ties to social networks and social capital (Coleman, 1988; Dika & Singh, 2002), such that greater educational attainment can assist in the formation of wider-reaching social networks, particularly advantageous to those with a disadvantaged background (Andersson, 2018). Highly educated individuals may be able to more carefully weigh their options and negotiate their treatment as well as leverage the knowledge and advice held by others in their network. For example, an individual with a college degree may have friends or colleagues who also have college degrees and could translate any jargon present in nursing homes' public-facing resources or detail all of the funding options available to them.

Educational attainment also has a deep, long-standing association with economic capital in the form of expansion of potential job opportunities as well as accumulation of financial resources over the life course (Thomson, 2018; NCES, 2021; Tamborini et al., 2015; Wolla & Sullivan, 2017). As mentioned above, the financial resources one has at their disposal may increase the quality of their conditions in the nursing home, however the existence of other institutional supports (Medicare and Medicaid) mitigates the need for out-of-pocket spending to access nursing homes as a care environment at all.

The relationship between education and nursing home *access* as described here predicts that the effect of greater educational attainment would be an increased likelihood of using a nursing home as an institutional resource, however, this is conditional on *need*.

Education as an influence on health: The nursing home NEED pathway

Education and the associated social and economic resources associated with greater educational attainment are broadly termed socio-economic status (SES) in the academic literature as well as public discourse. The life-course relationship between SES and health status and mortality risk was conceptualized by “fundamental social cause theory” (Link & Phelan, 1995). Fundamental social cause theory argues that the unequal distribution of resources and access – manifesting in disparities in the amount of “money, knowledge, power, prestige, and the kinds of interpersonal resources embodied in the concepts of social support and social network” between social groups (Link and Phelan, 1995, p. 87) – drives health disparities and differences in mortality and morbidity. They argue that the social, economic, and educational resources are transportable and adaptable across time, space, and circumstances, and “broadly serviceable” in addressing multiple risk factors and multiple health outcomes; this is the mechanism by which these disparities persist, despite increases in medical and technological innovations. Their findings have been corroborated widely, with evidence that stronger social relationships are linked to lower mortality (Holt-Lunstad et al., 2010). The Whitehall II study found a strong, persistent inverse association between employment status and various morbidities and health risks, and the size of the association has not diminished even over two decades (Marmot et al., 1991). Health can also have a reciprocal effect on education, as individuals with poor health and disabilities may face more barriers to completing their education and gaining access to the other

forms of capital associated with greater educational attainment. In this regard, both the knowledge and prestige afforded by greater educational attainment as well as the acquisition of financial and social opportunities and resources facilitated by educational attainment have a fundamental and enduring connection to better health over the life course.

However, the education and nursing home *need* relationship is not as straightforward in its directionality as the relationship between education and nursing home *access*. Greater educational attainment is associated with both longer lifespan as well as better health over the lifespan; the association between aging and development of health conditions is well established, but education's relationships with healthy behaviors and resource availability serve as a protective factor against developing those health conditions. Essentially, the effect of education on nursing home usage from a *need* perspective may be conditional, as there is both a positive effect on life expectancy (which brings an increased likelihood of developing health conditions at older ages) and a positive effect on overall health (which brings a decreased likelihood of developing health conditions).

Data, Methods, and Measures

Data

To explore the question of how education influences nursing home usage, I use data from the Health and Retirement Study, a longitudinal panel study ongoing since 1992 that surveys a representative sample of approximately 20,000 American adults in different birth cohorts. HRS is jointly conducted by the National Institute on Aging and the University of Michigan and supported by the NIA and the Social Security Administration.

HRS collects data on all aspects of respondents' lives, including health and health behaviors, current and prior occupations, finances, familial relationships, caregiving settings, usage of certain government services, and their perceptions of their wellbeing and longevity (Fisher & Ryan, 2018).

Because HRS begins with noninstitutionalized respondents but continues to interview any respondents who reside in nursing homes at the time of interview, several weighting adjustments to ensure that the sample is nationally representative are offered: one that does include both community dwelling participants and nursing home residents, and others that weight for either population but not both. Since my research questions require the inclusion of the combined weights, I used data from Wave 13 of the study – drawn from the 2016 survey round – as it was the most recent year for which the combined institutionalized and non-institutionalized survey weight was available at the time of analysis. The data were made available in the RAND HRS Longitudinal File. An analytic sample was constructed including all of the respondents who had non-missing observations for every one of the key variables. Only respondents over the age of 65 at the time of interview who had responses for all variables were included ($n = 7,135$).

Dependent Variables

The first model uses a binary outcome variable measuring if the respondent had either zero or at least one nursing home stay since their last interview (for more than 97% of respondents in the analytic sample, the last interview occurred two years prior in HRS wave 12). The second model uses a count outcome measuring the number of nights spent in a nursing home a respondent reported in the time since their last interview.

Independent Variables

The primary independent variable is educational degree attainment (categorical variable with the options of high school/GED, associate's degree, Bachelor's degree, and graduate degree, compared to the base category of no degree).

Additional predictors include: the log of aggregate wealth including IRA (continuous variable); retirement status (binary variable where 1 = individual reports being "completely" retired whereas 0 = individual reports any other status); couple status (1 = individual reports being in a couple); number of living children (ordinal variable); and proximity of non-resident children (binary variable where 1 = child lives within 10 miles of the individual). Also included as covariates are Medicaid recipient status (binary variable where 1 = recipient); age (continuous variable in years, calculated from the middle of the month when the interview was conducted); and gender (binary variable where 1 = female, 0 = male). Health indicators included were individual's experience of stroke (binary variable where 1 = individual reports experience of at least one stroke during their lifetime), individual's history of dementia (binary variable where 1 = individual reports ever receiving a dementia diagnosis). Sensitivity analyses were run using TICS score (measure of individual's score on the reduced 16-item Telephone Interview for Cognitive Status portion of the HRS survey) instead of history of dementia diagnosis, given that individuals experiencing cognitive impairments may be unable to accurately report their dementia diagnosis status (Ofstedal et al., 2005).

Race is included as a categorical variable of interest (with individuals reporting a racial identification of Black/African American or "Other" compared to the baseline of racial identification as white). The long history of racial stratification and discrimination in the U.S. has contributed to deep disparities in access to economic capital, educational opportunities, and health outcomes. Black/African Americans also tend to be more filial and feel more responsibility to

care for family members than their white counterparts (Jones et al., 2011; Pinquart & Sörensen, 2005), which may influence the degree to which nursing homes are seen as an acceptable option for later-life care.

Analysis

The analysis was conducted in two stages to more fully capture the relationship between education and nursing home use. In the first stage, the binary dependent variable indicates whether or not the respondent had stayed in a nursing home in the time since their previous interview. The first model is a logistic regression measuring the effect of the predictors on the odds of having at least one nursing home stay.

The second stage uses a zero-inflated negative binomial (ZINB) model, which estimates the effect of the same set of predictors on the expected count of nights spent in a nursing home in the time since the respondent's previous interview. Negative binomial models are recommended for limited dependent variables with overdispersed count outcomes; the zero-inflated form is used for cases where the dependent variable has an excess number of zeroes – appropriate in this case given that approximately 96% of respondents reported zero nights spent in nursing homes in the time since prior interview. The ZINB regression was chosen as it had the lowest Bayesian information criteria score among possible regression methods. The ZINB models assumes that among those who report no nights spent in nursing homes in the time since their last interview, there are two latent groups: those who have a zero probability of spending any nights in a nursing home, and those who may have spent time in a nursing home but did not experience a stay in the time since their last interview. The combined institutionalized and non-institutionalized survey weights were applied to both models.

Results

Table below presents descriptive results of key variables. Compared to the full analytic sample, the group of respondents who reported at least one nursing home stay in the time since their last interview had higher rates of identifying as white (89.7% compared to 87.8%), female (62.7 % compared to 54.6%), and attainment of a high school degree (62.0% compared to 53.3%). The sub-sample was older, at an average of 81.5 years compared to the 74.2 years of the full sample, and a greater proportion were Medicaid recipients (11.7% compared to 5.4%). The sub-sample also reported higher rates of ever having a stroke (25.7% compared to 9.5%) and ever having a dementia diagnosis (7.4% compared to 2.4%). These findings align with the demographics of nursing homes nationwide, as nursing homes are predominantly populated by older, non-Hispanic white, female individuals. In 2015-2016, the majority of nursing home residents (60.3% of residents staying under 100 days and 67.9% of residents staying longer than 100 days) were female, and 75.1% of all residents were non-Hispanic white (Harris-Kojetin et al., 2019).

Model 1: At least one nursing home stay

Table 2 presents the results of the logistic regression model with coefficients reported as odds ratios; negative relationships between variables are indicated by an odds ratio less than one rather than by sign. Net of all included covariates, compared to individuals with no degrees, individuals with a high school diploma and individuals with a Bachelor's degree experienced significantly higher odds of reporting any nursing home stay in the time prior to interview. Compared to respondents with no degree, those with a high school diploma had a 69.9% increase in the odds of reporting a nursing home stay ($p < .05$). Respondents with a Bachelor's degree

experienced an even greater increase in the odds of reporting a nursing home stay, with an increase of 115.3% in odds over respondents with no degree ($p < .01$). Other factors significantly associated with higher odds of nursing home usage were age, history of any dementia diagnosis, history of any stroke, and completely retired status. Couple status, racial identification as Black/African American compared to white, and the log of aggregate total wealth were significantly associated ($p < .001$, $p < .05$, and $p < .01$, respectively) with lower odds of reporting any nursing home stay. The sensitivity analysis run using TICS score instead of dementia diagnosis had no effect on the direction and significance of any of the independent variables, and in fact the effect size for holding a high school diploma (76%, $p < .01$) and for holding a Bachelor's degree (124%, $p < .01$) increased.

Model 2: Number of nights spent in a nursing home

Table 3 presents the results of the ZINB model. The coefficients reported under “Factor change in odds of always zero” are expressed in odds ratios, and the coefficients reported under “Factor change in expected count for those not always zero” are expressed in percent change in expected count; for both, a negative relationship between variables is indicated by a coefficient less than one.

The ZINB model confirms the trend of greater educational attainment associated with lower odds of using a nursing home at all in the assessment of effects of the predictors on the nights spent in nursing homes for the latent group of individuals with zero probability of staying in a nursing home (“Factor change in odds of always zero”). Net of all included covariates, attainment of a high school diploma was significantly associated with a 39% decrease in the odds of never staying at least one night in a nursing home compared to non-degree respondents ($p < .05$). Respondents with a Bachelor's degree reported an even greater decrease in the odds –

52.2% – of never reporting at least one night in a nursing home compared respondents with no degree ($p < .01$). Other factors significantly associated with lower odds of never experiencing an overnight nursing home stay were age, respondent reporting being completely retired, history of any stroke, and history of any dementia diagnosis. Significantly associated with higher odds of never experiencing a nursing home stay are couple status, racial identification as African American, and log of aggregate total wealth.

The ZINB model also assesses the effects of independent variables on the expected count of nights spent in nursing homes for the latent group of individuals who may have spent time in a nursing home but did not experience a stay in the time between their previous interview and the wave 13 interview. In this model, compared to no degree, greater education attainment did *not* have any significant effect on the expected count of nights spent in nursing homes. Age and history of any stroke were significantly associated with an increase in the expected count of nights ($p < .01$). Couple status, receipt of Medicaid, and the log of aggregate total wealth were significantly associated with a decrease in the expected count of nights spent in a nursing home among this group ($p < .05$). The sensitivity analysis run using TICS score instead of dementia diagnosis had no effect on the direction and significance of any of the independent variables.

Education therefore appears to play a different role in terms of respondents' duration of use versus odds of any use of nursing homes. While it may contribute to lower odds of any usage, it does not appear to affect the time spent in nursing homes for those who do use a nursing home. Across both models and both latent groups, couple status and total wealth appeared to serve as factors protecting against nursing home stays, while age and history of stroke predict higher utilization of institutional care, findings which are consistent with existing literature.

Discussion

Nursing homes are important late-life institutions that meet the health and social needs of more than 1 million older adults in the U.S. The resources – material, cognitive, and social – that individuals accumulate over their lifespan provide differential advantages and disadvantages in the development of their health and health needs and their ability to navigate institutional barriers to get those needs met.

Educational attainment appears to play an important role in contributing to any use of nursing homes at all, but not necessarily having an impact on the time spent in nursing homes among those who use them. Compared to having no degree, holders of a high school diploma and holders of a Bachelor's degree both experienced significant, substantial increases in the odds of reporting any nursing home stay (use). However, education as a factor had no significant effect on the number of nights (duration) spent in a nursing home among the latent group that may report at least one nursing home stay. The strongest relationship between education and nursing homes appears to lie in the pathway by which education provides the resources to *access* nursing homes as a healthcare institution, not in the pathway by which education mediates health which determines the *need* for nursing home care.

However, these results should not suggest that the latter pathway does not exist – but rather, that the mechanisms by which education affects one's health situation and the ways in which one meets their health needs may conflict to the point of appearing neutral in a quantitative model. Potential mechanisms underscoring the education-health-*need* pathway are elaborated further below.

Mechanism 1: Education increases longevity which increases health needs

An argument can be made that greater education contributes to a longer life expectancy. Hahn and Truman (2015) argue that education is “both a critical component of a person’s health and a contributing cause of other elements of the person’s concurrent and future health” (p. 658). There is evidence for both a correlational (Kitagawa & Hauser, 1973) and causal (Lleras-Muney, 2005) relationship between education and mortality, to the same effect that individuals with higher levels of education have lower levels of mortality and higher levels of life expectancy than their less-educated peers. Link and Phelan (1995) propose that the prevailing link between socioeconomic status and mortality and health is due to fundamental social cause theory, or the idea that health disparities are based on the unequal distribution of tangible and intangible resources (such as assets, knowledge, network, and prestige) in society.

Given both nursing home use and duration in residence increase with age, as evident in both models, more highly educated and wealthier individuals have longer lifespans and therefore more opportunities over time to become a long-term or temporary resident of a nursing home. This also reflects a population-level trend in that, “Improved health of the aged population has increased life expectancy and with that, increased the length of time that older adults may spend in a nursing facility (Laditka 1998)” (Shugarman & Brown, 2006, p. 2). However, the effect of education on nursing home usage persists controlling for age as a covariate, which suggests another mechanism may, in essence, override the effect of education on longevity on usage.

Mechanism 2: Education decreases health needs, particularly those associated with age

In opposition to this education-longevity explanation is research showing that education is negatively correlated with cognitive-related diseases such as Alzheimers and dementia (Sharp

& Gatz, 2011; Cummings et al., 1998), and cognitive impairments are generally very strong predictors of nursing home residence. Additionally, Langa et al. (2017) find that the declining rate of dementia in the U.S. has occurred since 2000 despite a significant increase in the cardiovascular risk profile (eg, prevalence of hypertension, diabetes, and obesity) among older US adults, possibly due in part to positive changes in the educational profile of Americans, as, “More years of education was associated with a lower risk for dementia, and average years of education increased significantly (from 11.8 years [95% CI, 11.6-11.9 years] to 12.7 years [95% CI, 12.6-12.9 years]; $P < .001$) between 2000 and 2012” (p. 58). This holds true among the analytic sample as well; net of age, race, and gender, education and total aggregate wealth both have significant negative effects on the probability of reporting any dementia diagnosis. Essentially, while more educated adults may live longer, they are also less susceptible to aging-related diseases associated with needing specialized care. Again, however, education continues to be a significant predictor of nursing home usage in the models net of dementia (or TICS score) and stroke history.

Mechanism 3: Individuals’ education may affect *how* they meet their health needs

Finally, I argue that an individual’s greater educational attainment may change how they meet any health needs they do have, particularly concerning the choice between institutional care and home care. Greater educational attainment may reduce the likelihood of having children who can or will move in to care for them in lieu of using a nursing home. The link between increasing education and decreasing fertility has been established for several decades, since Jain (1981)’s assertion that, “...in general, an increase in female education at the individual level is associated with a decrease in their cumulative marital fertility” (p. 583). More educated people are therefore likely to have fewer children, and the children that they do have will have greater educational

aspirations and outcomes (Dubow et al., 2009). Malamud and Wozniak found “a large causal role for higher education in geographic mobility” (p. 28), with college graduates “roughly twice as likely as high school graduates to have moved across state lines in the last five years” (p. 13). The relationship between education, geographic mobility, and the possibility of family care as a nursing home alternative provides a compelling explanation for the interaction between the educational attainment of the parent/aging generation and the opportunity costs faced by their children of providing unpaid family care instead of accumulating their own economic and social resources (e.g., pursuing a college degree or a career). In particular, it may explain why highly educated older adults are more likely users of nursing homes, given that nursing homes are not generally considered an ideal care setting – they have a limited number of alternatives.

Concluding Remarks

While I have named several plausible explanations for the pathways by which education affects use and duration of nursing home care, the *access* pathway continues to emerge as the most straightforward means by which education interacts with institutional care use; the mechanisms underlying the *need* pathway have a more complex relationship. My findings encourage future study of these mechanisms by which education may affect rates and *duration* of institutionalized care. The younger cohorts – and the Late Baby Boomers in particular – have higher educational attainment than their predecessors and therefore may eventually have different and higher rates of nursing home use. Additionally, the selection of highly educated adults into nursing homes indicates that the availability of the institutions as a resource may be inequitable in practice. Economically privileged adults (i.e., those with higher aggregate total wealth) experience less usage and fewer nights spent in nursing home in these models. Greater educational attainment and greater economic capital can act as mitigating factors along the *need*

pathway, however, their divergence in terms of how they affect nursing home usage substantiates the *access* pathway unique to education.

Nursing homes are one of many later-life care options – assisted living, paid home care, and home care provided by a relative or community member are other popular alternatives – however their ability to provide skilled nursing services (including the provision of medications and medical social services) is unique to those institutions. Continuing care retirement communities (CCRCs), which combine the features of community-style living with access to nursing home care, exist as a medium-term option between community living and institutionalization, however they are prohibitively expensive for most Americans with entrance fees in the hundreds of thousands – if not millions, in some cases -- along with monthly fees. Given that HRS data does not disaggregate the exact kind of nursing home used by respondents and that the wealth variable functions as a protective factor against nursing home use both in the access and need models, it is safe to assume that CCRCs play a negligible role in this study.

Research into the social determinants of nursing home use – in anticipation of the oncoming demographic shift towards an aging society in the U.S., the resulting demands on healthcare infrastructure, and the exacerbation of existing inequities in healthcare access and utilization – could not be more relevant. Additionally, future research could discern relationships between sociodemographic factors and the quality of nursing homes used, further developing the connection between accumulated resources/capital, use of later-life institutions, and the quality of services one can access at their chosen site.

Appendix

Table 1: Descriptive statistics of analytic sample.

*Survey weights applied (n = 7,135)

Variables	Sample Mean / %	Standard Deviation
Nights spent in nursing home in past 2 years	6.317	65.599
Number of NH stays in past 2 years	4.086%	
Educational attainment		
- Less than high school	12.005%	
- High school/GED	53.310%	
- Associate's degree / Lt BA	5.286%	
- Bachelor's degree	15.957%	
- Graduate degree (MA/MBA/JD/PhD/MD)	13.442%	
Total aggregate wealth	\$724,652.90	1,593,340
Completely retired	74.871%	
Couple status (married)	65.620%	
Number of living children	3.187	1.741
Child lives within 10 miles	54.459%	
Medicaid recipient	5.434%	
Age	74.216	7.374
Gender (female)	54.556%	
Ever experienced stroke	9.506%	
Ever diagnosed with dementia	2.366%	
TICS score	9.195	1.283
Race		
- White or Caucasian	87.780%	
- Black or African American	8.085%	
- Other	4.135%	

Table 2: Descriptive statistics of group reporting at least one nursing home stay since previous interview.

*Survey weights applied (n = 342)

Variables	Sample Mean / %	Standard Deviation
Nights spent in nursing home in past 2 years	154.603	287.430
Educational attainment		
- Less than high school	12.693%	
- High school/GED	61.962%	
- Associate's degree / Lt BA	1.978%	
- Bachelor's degree	16.027%	
- Graduate degree (MA/MBA/JD/PhD/MD)	7.339%	
Total aggregate wealth	\$606,136	1,517,651
Completely retired	92.332%	
Couple status (married)	37.400%	
Number of living children	3.539	1.970
Child lives within 10 miles	64.831%	
Medicaid recipient	11.654%	
Age	81.532	8.488
Gender (female)	62.740%	
Ever experienced stroke	25.749%	
Ever diagnosed with dementia	7.448%	
TICS score	8.712	1.566
Race		
- White or Caucasian	89.715%	
- Black or African American	6.716%	
- Other	3.570%	

Table 3: Results of logistic regression model: Any nursing home stay since previous interview.

*Survey weights applied (n = 7,135)

Variables	Odds Ratio (Robust Standard Error)	
Educational attainment (compared to less than HS)		
- High school/GED	1.699*	(0.351)
- Associate's degree / Lt BA	0.699	(0.312)
- Bachelor's degree	2.153**	(0.584)
- Graduate degree (MA/MBA/JD/PhD/MD)	1.300	(0.454)
Log of total aggregate wealth	0.912*	(0.035)
Completely retired	1.963*	(0.542)
Couple status (married)	0.511***	(0.086)
Number of living children	1.059	(0.036)
Child lives within 10 miles	1.317	(0.192)
Medicaid recipient	1.624	(0.408)
Age	1.091***	(0.010)
Gender (female)	0.953	(0.145)
Ever experienced stroke	2.621***	(0.406)
Ever diagnosed with dementia	1.883*	(0.540)
Race (compared to white)		
- Black or African American	0.611*	(0.147)
- Other	0.949	(0.421)

p < .05*, p < .01**, p < .001***

Table 4: Results of zero-inflated negative binomial model: Number of nights spent in nursing home since previous interview.

*Survey weights applied (n = 7,135)

Variables	Factor change in odds of always zero	Factor change in expected count for those not always zero
Educational attainment (compared to less than HS)		
- High school/GED	0.608*	0.787
- Associate's degree / Lt BA	1.404	0.809
- Bachelor's degree	0.478**	1.487
- Graduate degree (MA/MBA/JD/PhD/MD)	0.852	1.323
Log of total aggregate wealth	1.091*	0.898*
Completely retired	0.545*	1.707
Couple status (married)	1.836**	0.513*
Number of living children	0.953	1.042
Child lives within 10 miles	0.769	0.906
Medicaid recipient	0.613	0.466*
Age	0.923***	1.071***
Gender (female)	1.022	0.786
Ever experienced stroke	0.403***	2.545**
Ever diagnosed with dementia	0.520*	2.297
Race (compared to white)		
- Black or African American	1.652*	1.445
- Other	1.037	1.279

p < .05*, p < .01**, p < .001***

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